

~~Deterioration of bonding such that the at least one layer (6, 7) has peripheral dimensions substantially the same as or larger than those of the electrode material (5); said process comprising:~~

adhesive bonding the metal balls to the electrodes with a flux.--

--17. (New) A process for producing a semiconductor device comprising electrodes formed on a semiconductor chip, and bumps each consisting of a spherically formed metal ball having a given size, and adhesive bonded to the electrodes (8) for the attachment of the bumps, wherein each electrode (8) includes a layer of an electrode material (5) and at least one layer (6, 7) laminated to the layer of the electrode material (5) to avoid deterioration of bonding such that at least one of the at least one layer (6, 7) has a thickness which is smaller than that of the electrode material (5) and the at least one layer (6, 7) has peripheral dimensions substantially the same as or larger than those of the electrode material (5); said process comprising:

adhesive bonding the metal balls to the electrodes with a flux.--

--18. (New) The process according to claim 16 or 17 comprising:

applying the flux to the electrodes.--

--19. (New) The process according to claim 16 or 17, wherein the metal balls are adhesive bonded to the electrodes by a process comprising the steps of:

applying a vibration at a small amplitude to a vessel containing the metal balls to cause the metal balls to jump up;

arranging and holding the metal balls on an arrangement base plate by attracting the jumping up metal balls to attraction openings provided in the arrangement base plate in positions corresponding to the electrodes of the semiconductor chip to which the metal balls are to be adhesive bonded;

removing excess metal balls adhering either to the arrangement base plate or to the metal balls attracted to the attraction openings; and

simultaneously contacting the metal balls held and arranged on the arrangement base plate with the electrodes of the semiconductor chip.--

--20. (New) A process for producing a semiconductor device comprising electrodes formed on a semiconductor chip, and bumps each consisting of a spherically formed metal ball having a given size, and adhesive bonded to the electrodes (8) for the attachment of the bumps, wherein each electrode (8) includes a layer of an electrode material (5) and at least one layer (6, 7) laminated to the layer of the electrode material (5) to avoid deterioration of bonding such that the at least one layer (6, 7) has peripheral dimensions substantially the same as or larger than those of the electrode material (5); said process comprising:

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adhesive bonding the metal balls, each metal ball being spherically formed and having the given size, to the electrodes; and

reflowing the metal balls.--

--21. (New) A process for producing a semiconductor device comprising electrodes formed on a semiconductor chip, and bumps each consisting of a spherically formed metal ball having a given size, and adhesive bonded to the electrodes (8) for the attachment of the bumps, wherein each electrode (8) includes a layer of an electrode material (5) and at least one layer (6, 7) laminated to the layer of the electrode material (5) to avoid deterioration of bonding such that at least one of the at least one layer (6, 7) has a thickness which is smaller than that of the electrode material (5) and the at least one layer (6, 7) has peripheral dimensions substantially the same as or larger than those of the electrode material (5); said process comprising:

adhesive bonding the metal balls, each metal ball being spherically formed and having the given size, to the electrodes;

reflowing the metal balls.--

--22. (New) The process according to claim 20 or 21 comprising:

adhesive bonding the metal balls to the respective electrodes with a flux.--

--23 (New) The process according to claim 22 comprising:

apply the flux to the electrodes.--

--24. (New) The process according to claim 20 or 21, wherein the metal balls are adhesive bonded to the electrodes by a process comprising the steps of:

applying a vibration at a small amplitude to a vessel containing the metal balls to cause the metal balls to jump up;

arranging and holding the metal balls on an arrangement base plate by attracting the jumping up metal balls to attraction openings provided in the arrangement base plate in positions corresponding to the electrodes of the semiconductor chip to which the metal balls are to be adhesive bonded;

removing excess metal balls adhering either to the arrangement base plate or to the metal balls attracted to the attraction openings; and

simultaneously contacting the metal balls held and arranged on the arrangement base plate with the electrodes of the semiconductor chip.--

--25. (New) A semiconductor device produced by the process according to claim 16 or 17, provided with bumps consisting of metal balls adhesive bonded to the respective electrodes of the semiconductor chip.--

--26. (New) A semiconductor device produced by the process according to claim 20 or 21, provided with bumps consisting of metal balls on the electrodes of a semiconductor chip.--